

Amendments to the Claims

1. (currently amended) An isolated nucleic acid fragment comprising a nucleic acid sequence encoding a fatty acid desaturase or a [fatty acid desaturase-related] hydroxylase enzyme with an amino acid identity of 50% or greater to the polypeptide encoded by SEQ ID NOS:1, 3, 5, 7, 9, 11, or 15.

Claims 2-8 (cancelled)

Claims 9-10 (withdrawn)

Claims 11-12 (cancelled)

Claim 13 (withdrawn)

Claim 14 (cancelled)

Claims 15-20 (withdrawn).

Claims 21-23 (cancelled)

Claims 24-32 (withdrawn)

33. (currently amended) An isolated nucleic acid fragment comprising a nucleic acid sequence selected from the group consisting of:

(a) a nucleic acid sequence encoding a fatty acid desaturase or a [fatty acid desaturase-related] hydroxylase plant enzyme with an amino acid identity of 50% or greater to the polypeptide encoded by any one of the sequences set forth in SEQ ID NOS:1, 3, 5, 7, 9, 11, or 15, or

(b) a nucleic acid sequence or a part thereof which is useful in antisense inhibition or sense suppression of endogenous desaturase or hydroxylase activity in a transformed plant wherein the nucleic acid has an identity of 80% or greater to any one of the sequences set forth in SEQ ID NOS:1, 3, 5, 7, 9, 11, or 15 [or a part thereof].

34. (previously added) The isolated nucleic acid fragment of Claim 33 wherein the amino acid identity is 60% or greater to the polypeptide encoded by any one of the sequences set forth in SEQ ID NOS:1, 3, 5, 7, 9, 11, or 15.

35. (previously added) The isolated nucleic acid fragment of Claim 33 wherein the nucleic acid identity is 90% or greater to any one of the sequences set forth in SEQ ID NOS:1, 3, 5, 7, 9, 11, or 15

36. (previously added) The isolated nucleic acid fragment of any of Claim 33, 34 or 35 wherein said fragment is isolated from an oil-producing plant species.

37. (previously added) A chimeric gene comprising the nucleic acid fragment of Claim 33, 34 or 35 operably linked to suitable regulatory sequences.

38. (previously added) A plant comprising in its genome the chimeric gene of Claim 37.

39. (previously added) Seeds obtained from the plant of Claim 38.

40. (previously added) A method of producing seed oil containing altered levels of unsaturated fatty acids comprising:

- (a) transforming a plant cell of an oil-producing species with a chimeric gene of Claim 37;
- (b) growing fertile plants from the transformed plant cells of step (a);
- (c) screening progeny seeds from the fertile plants of step (b) for the desired levels of unsaturated fatty acids; and
- (d) processing the progeny seed of step (c) to obtain seed oil containing altered levels of unsaturated fatty acids.

41. (previously added) The isolated nucleic acid fragment of Claim 33, 34, or 35 comprising a nucleic acid sequence encoding a plant microsomal delta-12 fatty acid desaturase.

42. (currently amended) A nucleic acid fragment isolated from an oil-producing plant species wherein said fragment is selected from the group consisting of:

(i) an isolated nucleic acid fragment comprising a nucleic acid sequence encoding an enzyme which catalyzes a reaction at carbon positions 6 and 7 numbered from the methyl end of an 18 carbon long fatty acyl chain, wherein positions 6 and 7 correspond to carbon positions 12 and 13 numbered from the carbonyl carbon of an 18 carbon long fatty acyl chain and further wherein the amino acid sequence comprising said enzyme contains at least one of the following amino acid sequences selected from the group consisting of: AIPPHCF, AWXXYW, HECGH, LLVPY, WKYSHR, and SHRRHH;

(ii) an isolated nucleic acid fragment encoding an enzyme which catalyzes a reaction at carbon positions 6 and 7 numbered from the methyl end of an 18 carbon long fatty acyl chain wherein positions 6 and 7 correspond to carbon positions 12 and 13 numbered from the carbonyl carbon of an 18 carbon long fatty acyl chain wherein said isolated nucleic acid fragment encodes a protein comprising any one of the amino acid sequences set forth in SEQ ID NOS:2, 4, 6, 8, 10 or 12;

(iii) an isolated nucleic acid fragment encoding an enzyme which catalyzes a reaction at carbon positions 6 and 7 numbered from the methyl end of an 18 carbon long fatty acyl chain, wherein positions 6 and 7 correspond to carbon positions 12 and 13 numbered from the carbonyl carbon of an 18 carbon long fatty acyl chain wherein said isolated nucleic acid fragment hybridizes to the isolated nucleic acid fragment of (ii) under one of the following sets of conditions:

(a) hybridization in 50 mM Tris, pH 7.6, 6X SSC, 5X Denhardt's, 0.5% sodium dodecyl sulfate (SDS), 100 [μ g] μ g/ml denatured calf thymus DNA and 50°C and wash twice with 2X SSC, 0.5% SDS at room temperature for 15 min each, then wash twice with 0.2X SSC, 0.5% SDS at room temperature for 15 min each and then wash twice with 0.2X SSC, 0.5% SDS at 50 °C for 15 min each;

(b) hybridization in 6X SSPE, 5X Denhardt's solution, 0.5% sodium dodecyl sulfate (SDS), 5% dextran sulfate, 100 [μ g] μ g/ml denatured calf thymus DNA at 50°C and wash twice with 2X SSC, 0.5% SDS at room temperature for 15 min each, then wash twice with 0.2X SSC, 0.5% SDS at room temperature for 15 min each and then wash twice with 0.2X SSC, 0.5% SDS at 50 °C for 15 min each; or

(c) hybridization in 50% formamide, 5X SSPE, 1% sodium dodecyl sulfate (SDS), 1% Denhardt's Reagent, 100 [μ g] μ g/ml denatured salmon sperm DNA at 42 °C and wash twice with 2X SSPE, 0.2% SDS at 42° C for 15 min each, then wash twice with 0.2X SSPE, 0.2% SDS at 55 °C for 30 min each.

43. (previously added) A chimeric gene comprising the nucleic acid fragment of Claim 42 operably linked to suitable regulatory sequences.

44. (previously added) A plant comprising in its genome the chimeric gene of Claim 43.

Claims 45-59 (withdrawn).